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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,192	03/14/2005	Ulrich Sieben	Mic.7776	8685
50811	7590	03/17/2009		
O'Shea Getz P.C. 1500 MAIN ST. SUITE 912 SPRINGFIELD, MA 01115			EXAMINER WALTERS JR, ROBERT S	
			ART UNIT	PAPER NUMBER
			1792	
			MAIL DATE	DELIVERY MODE
			03/17/2009	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/511,192

**Applicant(s)**

SIEBEN ET AL.

**Examiner**

ROBERT S. WALTERS JR

**Art Unit**

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-12, 14 and 16-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-12, 14 and 16-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of Application***

Claims 1, 13 and 15 are cancelled. Claims 2-12, 14 and 16-21 are pending and presented for examination.

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/10/2009 has been entered.

### ***Response to Arguments***

Applicant's arguments filed 3/10/2009 have been fully considered but they are not persuasive. The applicant first argues that Matson (U.S. PGPUB No. 2003/0198968) is not applicable as prior art as an English translation of the PCT/EP03/03782 was provided. However, to receive priority to the foreign priority date of 4/12/2002 the applicant must submit a certified translation of the foreign priority document, DE10216446. The applicant further argues that one would not have been motivated to combine Wybourne (U.S. Pat No. 5465151) with Matson2 (U.S. PGPUB No. 2001/0039018) to arrive at amended claim 2, and that neither Wybourne or Matson2 teach that the polymer is from a group consisting of at least one of a polyimide or

polystyrene. The examiner disagrees with this contention. First, Wybourne does teach that the polymer may be a polymer selected from the list of Table I (column 9, lines 34-38) and the Table presents polystyrene as a potential polymer (see Table 1, column 10, at approximately line 37) as well as stating that, "Other candidate polymers include poly(imides) and poly(3-octylthiophene)." Second, with regards to the motivation to combine the references, the examiner is relying on Matson<sup>2</sup> only to show that the technique of spotting biomolecules is known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention that this general technique could be successfully applied in Wybourne's method, even though the polymeric substrate may not be identical.

Applicant's arguments with respect to claims 3-12, 14 and 16-21 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 3, 6, 7, 8, 11, 12, 17-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matson et al. (U.S. PGPUB No. 2003/0198968) in view of Hubbell et al. (U.S. PGPUB No. 2002/0128234).

Regarding claims 3, 6, 7, 8, 11, 12, 17-19 and 21, Matson teaches a method for immobilizing biomolecules on a substrate by applying a layer of polymer to the surface and immobilizing the biomolecules on the surface of the polymer layer (abstract). Matson further teaches that the polymeric layer may be hydrophobic (0018) and that the biomolecules may be applied by spotting (0095). Matson also teaches that the substrate may be an inorganic material (0042), that the polymeric layer can be activated by an oxygen plasma treatment (0070), and that the hydrophobic polymer can be applied in defined regions to provide hydrophobic sections and other sections that are not hydrophobic (0073).

Matson fails to teach the surface of the substrate being a sensor chip. However, Hubbell teaches immobilizing biomolecules on the surface of a polymer that has been applied to the surface of a sensor chip (abstract and Figure 2B). Hubbell teaches that this chip may be an inorganic semiconducting material such as silicon (0128) and that it may include sensors and circuits (0128-0129). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Matson's method by utilizing a silicon sensor chip as a substrate for application with an integrated circuit (see Hubbell at 0128-0132), as taught by Hubbell. One would have been motivated to make this modification as it would allow Matson's method to be utilized for applications in biosensors, medical diagnostics, and other biological areas requiring selective sensors for biomolecules.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

2. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wybourne et al. (U.S. Pat. No. 5465151) in view of Matson et al. (U.S. PGPUB No. 2001/0039018, hereinafter referred to as Matson2).

Regarding claim 2, Wybourne teaches a method for making biosensors capable of immobilizing biomolecules (abstract), wherein the biosensor has a surface, such as a semiconducting silicon dioxide, and that a polymeric material is applied over this surface, the polymeric material potentially being polystyrene, polyimide or poly(ethylenes), which are

hydrophobic and non-swelling (see Table 1, column 10 and column 10, lines 46-48). Wybourne further teaches that UV light can be used to functionalize or immobilize molecules on the polymer (column 13, lines 19-28). Wybourne fails to teach immobilizing the molecules by spotting. Matson2 teaches that spotting is a well known means of applying biomolecules to a support (0062). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wybourne's method by applying the biomolecules by spotting, as taught by Matson2. One would have been motivated to make this modification as this is a well known method of specifically applying a biomolecule to a substrate and one of ordinary skill in the art at the time of the invention could have utilized this approach to attach the biomolecules in Wybourne's method with a reasonable expectation of success and a predictable result.

3. Claims 3-12, 14, and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wybourne in view of Hubbell and Matson2.

Regarding claims 3-12, 14 and 16-21, Wybourne teaches a method for making biosensors (waveguides, see abstract) capable of immobilizing biomolecules (abstract), wherein the biosensor has a surface, such as a semiconducting silicon dioxide, and that a polymeric material is applied over this surface, the polymeric material potentially being polystyrene, polyimide or poly(ethylenes), which are hydrophobic and non-swelling (see Table 1, column 10 and column 10, lines 46-48). Wybourne further teaches that UV light can be used to functionalize or immobilize biomolecules on the polymer (column 13, lines 19-28). Wybourne fails to teach the substrate being a sensor chip, applying the biomolecule by spotting, applying the polymer in

predefined regions, and utilizing an oxygen plasma to provide the surface of the polymer layer with a charge.

However, Hubbell teaches immobilizing biomolecules on the surface of a polymer that has been applied to the surface of a sensor chip (abstract and Figure 2B). Hubbell teaches that this chip may be an inorganic semiconducting material such as silicon (0128) and that it may include sensors and circuits (0128-0129) and have the polymer layer utilized for application with an integrated circuit (0128-0132). Hubbell further teaches applying the polymer in predefined regions on the chip (0219-0220), as well as teaching that the substrate can be a polymer such as polystyrene which can be modified by an oxygen plasma, thereby imparting a charge to the polymer surface to make it more amenable to grafting (0014). Finally, Hubbell teaches that their particular method is actually amenable to waveguides (0225). Matson2 teaches that spotting is a well known means of applying biomolecules to a support (0062).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wybourne's method by utilizing a sensor chip as a substrate and also using an oxygen plasma treatment to help prepare the polymer layer for application of the biomolecules, as disclosed by Hubbell, and further applying the biomolecules by spotting, as generally taught by Matson2. First, one would have been motivated to modify Wybourne by applying the biomolecules by spotting as this is a well known method of specifically applying a biomolecule to a substrate and one of ordinary skill in the art at the time of the invention could have utilized this approach to attach the biomolecules in Wybourne's method with a reasonable expectation of success and a predictable result. Second, one would have been motivated to modify Wybourne's method by utilizing a sensor chip as it would allow Wybourne's method to



be utilized for applications in biosensors, medical diagnostics, and other biological areas requiring selective sensors for biomolecules. Furthermore, one of ordinary skill in the art at the time of the invention could have substituted a sensor chip as a substrate with a reasonable expectation of success (as both Wybourne and Hubbell teach their methods being employed in fabrications of waveguides) and the predictable result of providing a sensor chip that can be integrated into a larger electrical circuit to detect biomolecules. Finally, one would have been motivated to utilize an oxygen plasma treatment as it would allow the activation of the polystyrene allowing for rapid functionalization of that polystyrene in the subsequent immobilization steps.

### *Conclusion*

Claims 1, 13 and 15 are cancelled.

Claims 2-12, 14 and 16-21 are pending.

Claims 2-12, 14 and 16-21 are rejected.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT S. WALTERS JR whose telephone number is (571)270-5351. The examiner can normally be reached on Monday-Friday, 8:00am to 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571)272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ROBERT S. WALTERS JR/  
March 13, 2009  
Examiner, Art Unit 1792

/Michael Barr/  
Supervisory Patent Examiner, Art Unit  
1792

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